

Bellwork: 2/5/13

Factor the following expression:

$$3x^3 - 42x^2 + 144x$$

$$3x(x^2 - 14x + 48)$$
$$3x(x - 6)(x - 8)$$

$$\begin{array}{r|l} 48 & \\ 1 & 48 \\ 2 & 24 \\ 3 & 16 \\ 4 & 12 \\ 6 & 8 \end{array}$$

$$(x^2 - 6x)(8x + 48)$$
$$x(x - 6) - 8(x - 6)$$
$$3x(x - 8)(x - 6)$$

$$\begin{array}{r} 48 \\ -6-8 \end{array}$$

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Unit 3: Chapter 5 - Polynomial Functions

What is a polynomial function?

a function with more than one term.

examples:

$$x^2 + 7x + 6$$
$$3x^3 + 7x^2 + 6x - 4$$

$$2x - 5$$

$$x^{10} - 7x^7 + 6x^4 - 3x^3 + 2$$

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Standard Form of a Polynomial: highest exponent to the lowest exponent (combine any like terms)

Write each polynomial in standard form. Determine the degree of the polynomial.
highest exponent

a) $3x^3 - x + 5x^4$

$5x^4 + 3x^3 - x$

b) $4x - 6x^2 + x^4 + 10x^2 - 12$

$4x + 4x^2 + x^4 - 12$

SF: $5x^4 + 3x^3 - x$

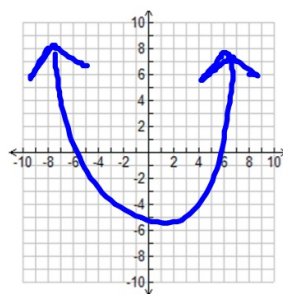
SF: $x^4 + 4x^2 + 4x - 12$

Degree: 4

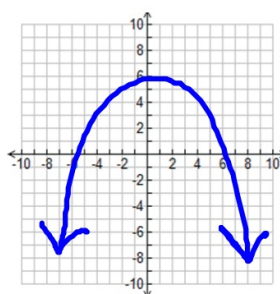
Degree: 4

The degree of a polynomial function affects the shape of the graph. It determines the maximum number of turning points (u-turns) and the end behavior (the direction of the graph to the left and right)

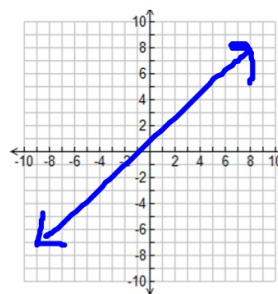
There are 4 types of end behavior:



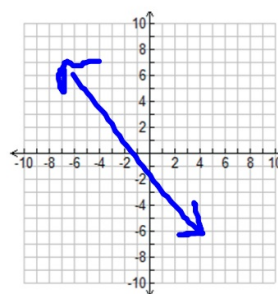
x^2
even \oplus
 $\uparrow\uparrow$



$-x^2$
even \ominus
 $\downarrow\downarrow$



x^1
odd \oplus
 $\downarrow\uparrow$



$-x^1$
odd \ominus
 $\uparrow\downarrow$

End Behavior Chart:

	even degree	odd degree
\oplus leading coeff.	$3x^2$ $\uparrow\uparrow$	$4x^3$ $\downarrow\uparrow$
\ominus leading coeff.	$-3x^2$ $\downarrow\downarrow$	$-4x^3$ $\uparrow\downarrow$

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Determine the end behavior of each polynomial function:

c) $y = -7x^3 + 3x^2 - 15$

d) $y = 6x^4 + 5x^2 + 1$

left: _____ right: _____

left: _____ right: _____

e) $y = -3x^3 + 7x + 4x^2 - 5$

f) $y = -x^7 + 6x^3 + 4x^1 + 2x$

left: _____ right: _____

left: _____ right: _____

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Turning Points: (U-turns)

Determine the possible number of turning points for each graph:

g) $x^3 + 4x^2 - x + 7$

h) $x^7 + 4x^8 - x^6 + 5x^3$

u-turns: _____

u-turns: _____

i) $x^4 + 3x^2 + x^3 - x^4$

j) $2x^2(3x^3 + 3x - 7)$

u-turns: _____

u-turns: _____

Homework: pg 285 #8-30 evens



